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Author(s)	TERANISHI, Cho
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TRIGONALOIDÆ FROM JAPAN AND KOREA (HYM.)

By

CHO TERANISHI

(With Pls. VI & VII)

According to the records we have seven species, one variety and one aberration of *Trigonaloidæ* in the Japanese Empire including five genera and three subfamilies.

In this present paper I have described eight species belonging to four genera, seven of which are new and one is the first record in Japan.

The material upon which this report is based was collected by Messrs. K. SATO, C. P. CLAUSEN and the author in Hokkaido, Honshu and Korea.

The types of these new species are preserved in the writer's collection and some paratypes in the United States National Museum.

Key to Genera and Species

1. Frontal carinae well developed, high and steep. Abdomen rather slender or depressed, apical two or three segments only slightly bent ventrally, never forming a hook. Metanotum rugose ... 2
Frontal carinae feebly developed, low and mound-shaped. Abdomen short and stout, apical two or three segments strongly curved ventrally, forming a hook. Metanotum not rugose ... 3
2. Wing transparent, abdominal segments from second to fifth with each a median notch at their posterior margins ... Genus *Orthogonalos* SCHULZ
 - A. Abdomen strongly depressed and flattend dorso-ventrally, distinctly edged laterally ... B
Abdomen more or less cylindrical, feebly depressed, lateral edge indistinct ... C
 - B. Cell R₅ touching cell M₄ directly, without a petiolar vein. Scutellum finely, longitudinally striate. First to third abdominal segments with a reddish yellow mark laterally. Antennae black ... *O. hagaromonis* sp. nov. ♀
Cell R₅ and M₄ connected with each other by a petiolar vein. Scutellum smooth, not striate. The first abdominal segment with two whitish marks. Antennae with several pale yellowish joints ... *O. debilis* sp. nov. ♀
 - C. Scutum black without a brownish spot. First to third abdominal segments with whitish marks

*E. STRAND, Ent. Mitt. II, Nr. 4, pp. 97-98 (1913) Formosa.

H. BISCHOFF, Arch. Naturg. 79, A, 2, pp. 150-156 (1913) Formosa.

" " 80, A, 1, pp. 93-96 (1914) "

T. UCHIDA, Insecta Matsum. III, 2, 3, pp. 77-80, Pl. II (1929) Japan.

- *O. elongata* sp. nov. ♀
 Scutum with a small brownish spot. Abdomen entirely black. ... *O. hirasana* sp. nov. ♂
 Fore wing with a fuscous band. Abdominal segments 2-5 not notched
 Genus *Pseudogonalos* SCHULZ *P. hahni* SPINOLA ♀
3. Fore wing with a fuscous spot at the radial region. Abdomen spherical and gibbous, the second segment enormously developed, convex dorso-ventrally, ventral surfaces of the second and third segments without the flattened portion near the posterior margin ... Genus *Poecilogonalos* SCHULZ
 Head and thorax entirely black. The second abdominal segment without a central longitudinal depression *P. maga* sp. nov. ♀, ♂
 Head black with yellow spots. Dorsum of the thorax ferruginous red with a dark tetragonal mark on the metanotum. The second abdominal segment dorsally with a central longitudinal depression *P. magnifica* sp. nov. ♀
 Anterior half of the fore-wing fuscous. Abdomen more or less elongate, fusiform, the second segment only slightly convex ventrally, the ventral surfaces of the second and third segments with a shining flattened portion near each posterior margin... ..
 Genus *Nanogonalos* SCHULZ *N. flavocincta* sp. nov. ♂

Genus *Orthogonalos* SCHULZ

1. *Orthogonalos debilis* sp. nov. (Pl. VI, Figs. 1, 1a, ♀)

♀. Length:—body 7.5 mm., fore-wing 7.0 mm.

Antennae 24-jointed, head and thorax except the metanotum shining, sparsely and weakly punctate, metanotum coarsely, irregularly rugose. Abdomen almost smooth and shining, much more weakly and sparsely punctate than the head and thorax.

Head black, with a small, pale yellow spot on each inner orbit of the eye. The basal half of the mandible pale yellow, the apical half reddish brown, with the teeth black. Antennae black, the apical half of the joints 12, 13-16 and the basal half of 17 brownish yellow.

Thorax black, with a pale yellow spot on the posterior end of the scutellum and on the post-scutellum. Fore and middle legs black, the second trochanters yellow, at the tips of the femora, tibiae and tarsi yellowish brown, the apical joints of the tarsi darker. The colour of the hind leg resembles that of the fore and middle legs, but the tibiae and tarsi being darker.

Abdomen black, the first segment with two tetragonal ivory-white spots which extend to the ventral surface, and there almost fuse together; the ventral surface of the second segment with two whitish transverse stripes which diffused irregularly and slightly extending to the dorsal surface.

Wings transparent with the stigma brown, cell R^5 connected with cell M^4 by a petiolar vein.

The whole body clothed with a short, whitish pubescence.

Habitat: Japan. Allotype, female, Mt. Minobu, Prov. Yamanashi, June 12, 1928 (K. SATO).

The frontal carinae of this species and the following three species are more prominent than that of *O. boliviana* SCHULZ (Hym. Stud., pp. 82-86, 1905, Genera Insect., Trigonaloidae, Pl. I, Fig. 19, 1907, genotype). The lateral opening of the abdominal segment, which is stated by SCHULZ to be one of the generic characters, is apparent in this species, but this character seems to me to be rather unstable.

2. *Orthogonalos hageromonis* sp. nov. (Pl. VI, Figs. 3, 3a, ♀)

♀. Length:—body 7.0 mm. Antennae 23-jointed.

Head shining, sparsely and weakly punctate. Thorax more closely and strongly punctate, not shining; scutellum finely, longitudinally striate, metanotum with coarse irregular rugosity, somewhat shining. Abdomen smooth and shining, much more sparsely and weakly punctate than the head; the dorsum of the first segment convex, and dorsally constricted at the suture between the first and second segments. Head black. The basal half of the mandibles pale yellow, the apical half dark reddish brown. Antennae black.

Thorax black. Fore and middle legs with the coxae and femora black, and the trochanters yellow with a brownish tinge, tibiae and tarsi brownish yellow, the apical segment of the tarsi darker. The hind legs with the first and second trochanters yellow, the third, and the tibiae and tarsi, dark brown.

Abdomen: the first and second segments reddish yellow with a large oval black spot on the dorsum of the first segment; a large, somewhat tetragonal brown mark on the dorsum, and two small dark spots near the posterior margin at the venter of the second segment; the sides and latero-anterior portion of the dorsum of the third segment reddish yellow, the remaining portions of the segment and the following four segments black.

Wings transparent, with the stigma brownish yellow, cell R^5 touching cell M^4 directly, without a petiolar vein, vein r touching the radius at the junction of R^5 .

Body covered with a short whitish pubescence.

Habitat: Japan. Allotype, female, paratype, one female, Meguro, Tokyo, May 5, 1928 (K. SATO).

This species is closely allied to *O. hageromonis*, but the scutum is more smooth and shining; the first abdominal segment more conspicuously convex dorsally, the scutellum longitudinally striate, with a different somatic coloration.

3. *Orthogonalos hirasana* sp. nov. (Pl. VI, Figs. 2, 2a, ♂)

♂. Length:—body 7.5 mm. Antennae 24-jointed, very slender, lacking *Tyloiden*.

Head broader than thorax, the frontal carinae high and prominent. Abdomen feebly depressed, slightly edged at the sides; segments 2-5 with a faint notch at the middle of each posterior margin; in profile the dorsal surface feebly arcuate and straight ventrally.

Head and thorax finely punctate, shining, the metanotum sparsely rugose. Abdomen smooth and shining.

Head black, mandibles except the teeth, clypeus except the anterior margin, the inner orbit of the eye and a slender stripe on the cheek pale yellow. Antennal joints 1-12 black, 13-16 ivory-yellow and 17-24 dark brown.

Thorax black; scutum with an indistinct brownish spot at the middle of the posterior portion; an elongate spot which is longitudinally divided into two parts on the scutellum and a small spot on the postscutellum yellow. Fore legs brown, trochanters paler, tibiae and tarsi yellowish brown, middle and hind legs darker.

Abdomen black, the venter of the first segment pale brown, that of the second with a dull whitish band which is irregularly diffused anteriorly.

Wings transparent. Cells R^5 and M^4 connected by a petiolar vein.

Body densely clothed with a short whitish pubescence.

Habitat: Japan. Holotype male, Mt. Hira, Prov. Shiga, July, 1927 (the author).

This species provisionally placed in the genus *Orthogonalos* owing to its comparatively broad head, and the much slenderer and cylindrical abdomen as compared with the genotype *O. boliviana* SCHULZ (Hym. Stud., pp. 81-82, 1905, Fig. 4, male).

4. *Orthogonalos elongata* sp. nov. (Pl. VII, Figs. 2, 2a, 2b, ♀)

♀. Length:—body 10.5 mm.; fore wing 9.0 mm. Antennae 25-jointed, lacking *Tyloiden*.

Head shining, weakly and sparsely punctate. Thorax slightly shining, much more strongly and closely punctate than the head, metanotum sparsely rugose, postscutellum in profile rather prominent, scutellum feebly, longitudinally depressed in the middle. Abdomen smooth and shining, rather slender and slightly depressed.

Head black, mandibles, except the teeth, and two spots on the clypeus pale yellow, the inner orbit of the eye and two spots near the posterior corner of the head yellow. Antennae black, with joints 12-18 ivory-yellow.

Thorax black, with an elongate spot on the scutellum and a transverse spot on the middle of the postscutellum pale yellow. Legs black, with the tibiae and tarsi brownish.

Abdomen black, the first segment with two large tetragonal whitish marks which extend to the ventral surface where they are fused; the second and third segment near each posterior margin with two transverse whitish stripes, both of which extending to the ventral surface where they are fused and forming a undulated band; the venter of the fourth segment near the posterior lateral margins with two whitish spots.

Wings transparent, cells R^5 and M^4 connected by a petiolar vein.

Thorax covered with a rather long whitish pubescence, the hair on the head and abdomen being shorter.

Habitat: Japan. Allotype, female, Maruyama-park, Sapporo, Hokkaido, July 24, 1923 (the author).

This species closely allied to *O. hirasana*, previously being described from a single male, but the coloration of the body and the appendages differ. This species is doubtful in its position, but momentarily the author place this in the genus *Orthogonalos*, the further investigation being necessary.

Genus *Pseudogonalos* SCHULZ

5. *Pseudogonalos hahni* (SPINOLA) (Pl. VII, Figs. 1, 1a, 1b, ♀)

Trigonalos hahni SPINOLA, Mag. Zool., Vol. 10, p. 53, p. 1 (1840).

♀. Length:—body 12.0–8.7 mm.; fore-wing 10.0–7.0 mm.

Antennae 26-jointed. Mandibles, left 3-, right 4-toothed.

Head somewhat shining and finely punctate. Thorax frosted, strongly and closely punctate, the metanotum irregularly rugose. Abdomen smooth and shining, very weakly and sparsely punctate.

Body black, at the tips of the frontal carinae and two round spots on the posterior lateral portion of the second abdominal segment yellow. Antennae black, with several apical segments brownish. Legs black, with the trochanters yellow, the fore-tibiae and -tarsi being brownish.

Fore wings with a fuscous band which becomes paler posteriorly. Stigma brownish yellow.

The whole body and appendages clothed with a whitish shining pubescence.

Four females of this well known European species were collected by the author in Sapporo, Hokkaido (July 24–29, 1923).

Genus *Poecilogonalos* SCHULZ

6. *Poecilogonalos magnifica* sp. nov. (Pl. VII, Figs. 3, 3a, 3b, ♀)

♀. Length:—body 13.0 mm.; fore-wing 12.7 mm. Antennae 25-jointed.

Mandibles, left 3-, right 4-toothed.

Head and abdomen closely punctate, somewhat shining, abdomen with a shining median line, the dorsum of the first segment more sparsely punctate and shining than the other segments, the dorsum of the second with a central longitudinal depression. The thorax shagreened and frosted.

Head black, a spot on each mandible, on each side of the clypeus, on the inner and outer orbits of the eyes and a small triangular spot surrounding the antennal insertion yellow; a transverse line on the occipital region brownish yellow. The antennae black.

Thorax ferruginous red dorsally, at the ventral surface black, with a transverse spot on each side of the postscutellum yellow. The metanotum somewhat darker, with a quadrate mark on the caudal end, a spot on the central line at the anterior margin and a large mark on each lateral surface black. Coxae and the fore and middle trochanters yellow with brownish marks on the ventral surfaces; the posterior trochanter, the basal half of the femora, the tibiae and the under-surface of the posterior femora yellow, the remaining parts of the legs dark brown.

Abdomen black, with a transverse yellow band on the first and second segments, that of the former extending to the ventral surface; the venter of the second segment with a small yellow spot at each posterior lateral portion.

Fore-wing with a fuscous spot at the radial region, stigma brownish yellow, cell R^5 directly touching cell M^4 .

Pubescence whitish on the head and thorax, brownish on the abdomen.

Habitat: Korea. Allotype female, Mt. Kongo, July, 1924 (K. SATO).

This species is allied to *Poecilogonalos fasciata* STRAND (Ent. Mitt., 11, pp. 97-98, 1912; BISCHOFF, Arch. Naturg. 70, A, 2, pp. 152-153, 1913), recorded from Formosa, but the colour of the metanotum differs, the fifth and the succeeding abdominal segments lacking yellowish markings, and the underside of the antennal scape being not yellow. The colour of the metanotum resembles somewhat that of *Poecilogonalos fasciata* var. *kibunensis* UCHIDA (Insecta Matsum., III, 2 & 3, p. 77, Taf. 11, Fig. 1), but the shape of the central mark is quite different.

7. *Poecilogonalos maga* sp. nov. (Pl. VII, Figs. 4, 4a, 4b, ♀)

♀. Length:—body 6.5-9.7 mm.; fore-wing 6.0-9.0 mm. Antennae 23-jointed (in some specimens 24-jointed). Mandibles, left 3-, right 4-toothed.

Head and mandibles closely punctate, somewhat shining. Thorax shagreened and frosted. Abdomen shining, very weakly and sparsely punctate, the dorsum of the first segment very smooth and shining, without punctures, the

dorsum of the second segment lacking the central longitudinal depression.

Head and thorax entirely black, mandibles with a reddish brown spot (indistinct in some individuals).

Abdomen black, the first segment with two yellow spots near the posterior margin, the second segment with two similar transverse yellow stripes (in some individuals these spots and stripes are fused and form bands).

Legs with the coxae and femora black, the hind trachanters yellow, the fore and middle trochanters fuscous, the tarsi and fore tibiae pale brown, the terminal segments of the tarsi, the middle and hind tibiae darker.

Fore-wing with a fuscous spot at the radial region, the stigma black, cell R^5 directly touching cell M^4 .

The whole body and the appendages clothed with a glittering whitish pubescence.

♂. (Pl. VII, Figs. 4c, 4d, 4e)

Length:—body 6.0–9.0 mm.; fore-wing 5.4–7.8 mm.

Antennae 22-jointed (in some individuals 23-jointed) with *Tyloiden* usually on segments 10–14, though in some specimens on segments 9–14 or 11–13.

The sculpture is more conspicuous than in the female, especially so on the abdomen. Abdomen comparatively slender. Antennae dark brown. The body black, without marking. Fore-wing as in the female, but the fuscous spot in some individuals is paler.

Habitat: Japan. Allotype female, Shimajima, Prov. Nagano, July, 1927 (K. SATO). Holotype male, Shimajima, July, 1927 (K. SATO). Paratype, two females and four males, Shimajima July, 1927 (K. SATO) three females and two males, Shimajima July, 1928 (C. P. CLAUSEN) four females and six males, Sapporo, Hokkaido, July, 1923 (the author). Paratype, one female and one male in the United States National Museum.

This species differs greatly from any species of the genus previously described in having the head and thorax entirely black, lacking the central longitudinal depression on the second abdominal segment.

Oviposition-habit

Oviposition of this wasp was observed by the author at Sapporo, Hokkaido on July 20, 1923. Eggs were laid on the under-surface of a bamboo-leaf near the margin. In a glass jar one female laid 3,599 eggs on a bamboo-leaf during the period from July 24 to July 27. In the laboratory two females collected on July 24 laid several eggs on the under-surface of the leaves of *Lespedeza bicolor*.

The egg (Pl. VI, Figs. 5, 5a) semioval in dorsal view, 0.1 mm. in length,

with longitudinal strigae on the dorsal surface. The micropylar protuberance rather prominent.

Both sexes spread their wings latero-posteriorly when resting on the leaves.

Genus *Nanogonalos* SCHULZ

8. *Nanogonalos flavocincta* sp. nov. (Pl. VI, Figs. 4, 4a, ♂)

♂. Length:—body 11.0 mm.; fore-wing 9.0 mm.

Antennae 24-jointed (in some individuals 23-jointed, with *Tyloiden* on the segments 10–15 or 16. Mandibles, left 3-, right 4-toothed.

With the generic characters as stated by SCHULZ (Genera Insect., Trig. pp. 9–10, 1907), but in this species a rather distinct central longitudinal furrow is visible on the scutellum.

Head nearly as broad as the thorax, somewhat shining, closely punctate; antennal scapes smooth, shining and very sparsely punctate. Thorax more closely, strongly punctate and frosted. Abdomen more sparsely punctate and more shining than in the head. The depression on the dorsum of the first segment with arcuate strigae. The venter of the second and third segments near the posterior margin with a flattened shining portion, the posterior one being not so distinct as in the anterior.

Head black, with the following yellow markings: a small spot on the inner orbit and a elongate spot on the outer orbit of eye, and a very small spot at the tip of the frontal carina. Antennae brown with the scapes black. The bases of the mandibular teeth dark-red.

Thorax black with the postscutellum orange-yellow. Legs: the first trochanter and coxae of the fore legs black, the second trochanter dull-yellow with a black spot, the tips of the femora, tibiae and tarsi yellowish brown, the middle legs just like the fore legs except the tibiae and tarsi being darker. The hind legs resembling the middle legs, the tips of the coxae and the trochanters being pale yellow, a small brownish spot on the under-surface of the first trochanter.

Abdomen black, at the posterior margin of the first segment reddish brown, being somewhat more distinct on the ventral surface, diffused and somewhat yellowish on the sides; the second segment with a distinct orange-yellow band which is intercepted by a flattened portion at the venter; segments 4–6 with each a large yellow mark on the dorsum, one of which on the fourth segment is broadly triangular in form.

Fore-wings almost at the anterior half fuscous, stigma brownish yellow, cell R^5 directly touching cell M^4 .

The whole body densely clothed with a glistening whitish pubescence.

Habitat: Korea. Holotype male, paratype four males, Suigen, May, 1928, (C. P. CLAUSEN).

Paratype, one male in the United States National Museum.

This species differs from *N. taihorina* BISCHOFF in its much larger size, the comparatively slenderer head and its coloration.

摘 要

日本帝國產の釣腹蜂科* *Trigonaloidae* に関しては STRAND, BISCHOFF, 内田 諸氏の研究ありて、七種、一變種、一變形を産する事報告されたり。筆者は本文に於て 北海道、本州、朝鮮より八種を記載せり、内七種は新種にして、残りの一種は歐洲と共通種なり。之等に和名を與ふる事次の如し。

1. <i>Orthogonalos debilis</i>	sp. nov.	ツヤハゴロモカギバラ
2. <i>O. hagoromonis</i>	sp. nov.	ハゴロモカギバラ
3. <i>O. hirasana</i>	sp. nov.	ヒラハゴロモカギバラ
4. <i>O. elongata</i>	sp. nov.	ナガハゴロモカギバラ
5. <i>Pseudogonalos hahni</i>	SPINOLA	フタボシカギバラ
6. <i>Poecilogonalos magnifica</i>	sp. nov.	オホタマカギバラ
7. <i>P. maga</i>	sp. nov.	タマカギバラ
8. <i>Nanogonalos flavocincta</i>	sp. nov.	キヲビカギバラ

* 昆蟲世界、318, p. 17, 1924. [内田學士の偽葉蜂科 (Insecta Matsum., III, 2 & 3, p. 80, 1929) に同じ]